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S1	84	(catmull with clark)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/07 14:27
S2	72	(catmull adj clark)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/07 14:40
S3	62	S2 and vertex	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/07 14:40
S4	28	S3 and extraordinary	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/11/07 14:40

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Edwin E. Catmull
July 1977 **ACM SIGGRAPH Computer Graphics , Proceedings of the 4th annual conference on Computer graphics and interactive techniques SIGGRAPH '77**, Volume 11 Issue 2
Publisher: ACM Press
Full text available:  [pdf\(7.19 KB\)](#) Additional Information: [full citation](#)

2 [Educating the digital artist for the entertainment industry \(panel\): the collision of academia and business](#) 
Charles S. Swartz, Edwin E. Catmull, Robin King, Richard Weinberg, Jane Veeder
August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**
Publisher: ACM Press/Addison-Wesley Publishing Co.
Full text available:  [pdf\(450.02 KB\)](#) Additional Information: [full citation](#)

3 [Proceedings of the 1992 symposium on Interactive 3D graphics](#) 
Marc Levoy, Edwin E. Catmull, David Zeltzer
June 1992 proceeding
Publisher: ACM Press
Additional Information: [full citation](#), [index terms](#)

4 [An analytic visible surface algorithm for independent pixel processing](#) 
Edwin Catmull
January 1984 **ACM SIGGRAPH Computer Graphics , Proceedings of the 11th annual conference on Computer graphics and interactive techniques SIGGRAPH '84**, Volume 18 Issue 3
Publisher: ACM Press
Full text available:  [pdf\(542.93 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An algorithm is presented that solves the visible surface problem at each pixel

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valence **vertices** are **extraordinary vertices**. Averaging for triangular surfaces is similar to quadrilateral surfaces. For each **vertex** in the mesh, we ...

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same **vertex**. If any **extraordinary** corner of valence $N > 4$ is ... The B-rep **model** is defined as. **Catmull-Clark** subdivision surfaces, a network of G ...

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Catmull-Clark regular rules. New **vertex** shown as dot ...

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this variation in curvature around the **extraordinary vertex**. To demonstrate our method we present results for. the **Catmull-Clark** [CC78], 4-8 [Vel01, ...

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vertices connected to this **vertex** by an edge. In the. case of **Catmull-Clark**, if the **vertex** valence is not. four the **vertex** is denoted as an **extraordinary** ...

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and the **extraordinary vertex**. Valence (the number of connected **vertices**) of the ... The **Catmull-Clark** scheme was one of the first schemes for the surface ...

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1. **Dynamic Catmull-Clark subdivision surfaces**

Hong Qin; Mandal, C.; Vemuri, B.C.;
Visualization and Computer Graphics, IEEE Transactions on
Volume 4, Issue 3, July-Sept. 1998 Page(s):215 - 229
Digital Object Identifier 10.1109/2945.722296

[AbstractPlus](#) | [References](#) | Full Text: [PDF\(1428 KB\)](#) IEEE JNL
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2. **Polygonal decomposition of the 1-ring neighborhood of the Catmull-Clark**

Ivrissimtzis, I.P.; Zayer, R.; Seidel, H.-R.;
Shape Modeling Applications, 2004. Proceedings
2004 Page(s):101 - 109
Digital Object Identifier 10.1109/SMI.2004.1314497

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3. **Turning the approximating Catmull-Clark subdivision scheme into a local surface modeling tool**

Claes, J.; Beets, K.; van Reeth, F.; Iones, A.; Krupkin, A.;
Shape Modeling and Applications, SMI 2001 International Conference on,
7-11 May 2001 Page(s):42 - 48
Digital Object Identifier 10.1109/SMA.2001.923374

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4. **Interpolation over arbitrary topology meshes using a two-phase subdivis**

Zheng, J.; Cai, Y.;
Visualization and Computer Graphics, IEEE Transactions on
Volume 12, Issue 3, May-June 2006 Page(s):301 - 310
Digital Object Identifier 10.1109/TVCG.2006.49

[AbstractPlus](#) | Full Text: [PDF\(1640 KB\)](#) IEEE JNL
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5. **And the Oscar goes to ... [computer graphics]**

Perry, T.S.;
Spectrum, IEEE
Volume 38, Issue 4, April 2001 Page(s):42 - 49
Digital Object Identifier 10.1109/6.915188

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1 Non-uniform recursive subdivision surfaces

Thomas W. Sederberg, Jianmin Zheng, David Sewell, Malcolm Sabin

July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Publisher: ACM Press

Full text available: [pdf\(1.45 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



Keywords: B-splines, Catmull-Clark surfaces, Doo-Sabin surfaces

2 Approximation & refinement: Data-dependent fairing of subdivision surfaces



Ilja Friedel, Patrick Mullen, Peter Schröder

June 2003 **Proceedings of the eighth ACM symposium on Solid modeling and applications**

Publisher: ACM Press

Full text available: [pdf\(945.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we present a new algorithm for solving the data dependent fairing problem for subdivision surfaces, using Catmull-Clark surfaces as an example. Earlier approaches to subdivision surface fairing encountered problems with singularities in the parametrization of the surface. We address these issues through the use of the characteristic map parametrization, leading to well defined membrane and bending energies even at irregular vertices. Combining this approach with ideas from data-dep ...

Keywords: CAD, Catmull-Clark, bicubic b-splines, fairing, geometric modeling, nonlinear minimization, subdivision surfaces, thinplate energy

3 Exact evaluation of Catmull-Clark subdivision surfaces at arbitrary parameter values



Jos Stam

July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Publisher: ACM Press

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bic patches assigned to each **extraordinary vertex** of. the initial mesh). Each normal element is a bicubic surface **patch** and. hence dened by 16 **vertices** ...
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Gabriel Taubin

September 1995 **Proceedings of the 22nd annual conference on Computer graphics and interactive techniques**

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Interpolating Subdivision for meshes with arbitrary topology - group of 26 »

D Zorin, P Schröder, W Sweldens - Proceedings of the 23rd annual conference on Computer ... , 1996 - portal.acm.org

... Nasri [17] presents such a modification for the Doo-Sabin scheme, while Halstead et al. [11] do the same for the **Catmull-Clark** scheme. ...
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H Biermann, A Levin, D Zorin - Proceedings of the 27th annual conference on Computer ... , 2000 - portal.acm.org

... In this paper we introduce improved rules for **Catmull-Clark** and Loop subdivision that overcome several problems with the original schemes, namely, lack of ...
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D Zorin - California: California Institute of Technology, 1998 - portal.acm.org

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4-8 Subdivision - group of 3 »

L Velho, D Zorin - Computer Aided Geometric Design, 2001 - Elsevier

... gives raise to the Loop subdivision scheme, and tensor product biquadratic and bicubic splines lead to Doo-Sabin and **Catmull-Clark** subdivision respectively ...
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H Biermann, I Martin, F Bernardini, D Zorin - Proceedings of the 29th annual conference on Computer ... , 2002 - portal.acm.org

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A unified framework for primal/dual quadrilateral subdivision schemes - group of 12 »

D Zorin, P Schröder - Computer Aided Geometric Design, 2001 - Elsevier

... respectively vertices. The scheme of **Catmull-Clark** is an example of the former, while the Doo-Sabin scheme exemplifies the latter. In ...
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Smoothness of Stationary Subdivision on Irregular Meshes - group of 6 »

D Zorin - Constructive Approximation, 2000 - Springer

... Mostcommonlyusedschemes(**Catmull-Clark**, Doo-Sabin, Loop, Butterfly) have subdivision

matrices with largest eigenvalues $1, \lambda$, with $1 > \lambda$ and λ having ...

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